

Claims

What is claimed is:

1. A current monitoring and interrupting circuit, comprising:
  - an electrically conductive line carrying a current;
  - a sensor that outputs a voltage level indicative of a magnitude of the current;
  - a comparator that compares the voltage level to a reference potential and generates a circuit indicator signal; and
  - a logic-based current interrupter that controls the current in the line in response to the circuit indicator signal.
2. The circuit of claim 1, further including a current switch disposed in the electrically conductive line and connected to the logic-based interrupter.
3. The circuit of claim 2, wherein the current switch includes a MOSFET.
4. The circuit of claim 1, further including a fuse disposed in the electrically conductive line.
5. The circuit of claim 1, wherein the electrically conductive line is part of an electrical bus energized to at least 60 VDC.
6. The circuit of claim 1, wherein the electrically conductive line is part of an electrical bus energized to at least 200 VDC.

7. The circuit of claim 1, wherein the electrically conductive line is part of an electrical bus energized to at least 300 VDC.

8. The circuit of claim 1, wherein the electrically conductive line is part of a vehicular electrical bus.

9. The circuit of claim 1, wherein the sensor includes a Hall effect device.

10. The circuit of claim 1, wherein the logic-based current interrupter includes a boolean logic device.

11. The circuit of claim 10, wherein the boolean logic device includes a flip flop.

12. The circuit of claim 1, further including a reset circuit.

13. The circuit of claim 1, further including an indicator that signals whether the current is flowing in the electrically conductive line.

14. A method of monitoring and interrupting current flowing in an electrically conductive line, comprising:

sensing the current flowing in the electrically conductive line;

generating a voltage level indicative of a magnitude of the current;

comparing the voltage level to a reference voltage and generating a circuit indicator signal; and

using a logic-based device to cause an interruption of the current flowing in the electrically conductive line if the circuit indicator signal is indicative of a condition where the voltage level is higher than the reference voltage.

15. The method of claim 14, wherein the logic-based device includes a flip flop that controls a current switch.

16. The method of claim 15, wherein the current switch includes a MOSFET.

17. The method of claim 14, further including resetting the logic-based device to restore the current flowing in the electrically conductive line.

18. The method of claim 17, wherein the step of resetting is performed automatically.

19. The method of claim 14, further including generating an indicator signal that conveys whether the current is flowing in the electrically conductive line.

20. The method of claim 14, wherein the current flowing in the electrically conductive line is a direct current (DC).

21. A circuit breaker for interrupting a flow of current in an electrically conductive line, comprising:  
a sensor that outputs a voltage level indicative of a magnitude of the current;

a comparator that compares the voltage level to a reference potential and generates a circuit indicator signal;

a logic device that receives the circuit indicator signal and generates a current interrupt signal when the circuit indicator signal corresponds to a condition where the voltage level is greater than the reference potential; and

a current switch that selectively prevents the flow of current in the electrically conductive line in response to the current interrupt signal.

22. The circuit breaker of claim 21, wherein the sensor includes a Hall effect current transducer.

23. The circuit breaker of claim 21, wherein the logic device includes a flip flop.

24. The circuit breaker of claim 21, wherein the current switch includes a MOSFET.